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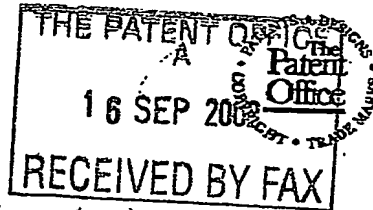
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P01/7700 000-0221433.6

1/77

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Cardiff Road  
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ids.2499.uk.jaf

**2. Patent application number**

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16 SEP 2002

0221433.6

**3. Full name, address and postcode of the or of each applicant (underline all surnames)**

08465486 001

Patents ADP number (if you know it)

Infinite Data Storage Ltd  
1 Pitreavie Court  
South Pitreavie Business Park  
Dunfermline  
Fife KY11 8UG

If the applicant is a corporate body, give the country/state of its incorporation

United Kingdom

**4. Title of the invention**

Direct connection of an optical data storage device and a consumer electronic device

**5. Name of your agent (if you have one)**

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

Kennedys Patent Agency Limited  
Queen's House, Floor 5  
19-29 St Vincent Place  
Glasgow G1 2DT

Patents ADP number (if you know it)

04973837002

**6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number**

Country

Priority application number  
(if you know it)Date of filing  
(day / month / year)**7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application**

Number of earlier application

Date of filing  
(day / month / year)**8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:**

- a) any applicant named in part 3 is not an inventor, or
  - b) there is an inventor who is not named as an applicant, or
  - c) any named applicant is a corporate body.
- See note (d))

Yes

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Description 10

Claim(s) —

Abstract —

Drawing(s) 1 *only*

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Priority documents —

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Statement of inventorship and right to grant of a patent (*Patents Form 7/77*) —Request for preliminary examination and search (*Patents Form 9/77*) —Request for substantive examination (*Patents Form 10/77*) —Any other documents —  
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11.

I/We request the grant of a patent on the basis of this application.

Signature *Kennedy* Date

KENNEDYS PATENT AGENCY LIMITED 16.09.2002

12. Name and daytime telephone number of person to contact in the United Kingdom

Jim Adams - 0141 226 6826

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Direct connection of an Optical Data Storage device and a  
consumer electronic device

1

2 This invention relates to optical data storage in  
3 particular interface control for optical storage device.

4

5 The storage of data files of all varieties on optical  
6 storage medium currently requires the use of a personal  
7 computer to control the interface between the storage  
8 medium and the source of the data to be stored. The  
9 present invention removes the requirement for the  
10 personal computer.

11

12 The growth in digital consumer electronic devices over  
13 the last 5 years has been explosive. Increasing features  
14 available to the consumer has driven this growth. If the  
15 example of digital still camera (DSC) is considered, the  
16 consumer has been attracted by the ability to instantly  
17 view, delete and in some cases modify the pictures they  
18 have just taken, without the need for a "developing"  
19 stage. The consumer can further produce "photo quality"  
20 images with a low costs printer, connected to a personal  
21 computer (PC). Recent developments have seen the

2

1 introduction of stand-alone printers, which can connect  
2 directly to a DSC, or can have the flash media typically  
3 used for the cameras connected directly to it. This  
4 removes the requirement for a PC for the printing images.

5  
6 Storage of the digital images produced is not done within  
7 the DSC or the flash media used within these cameras, due  
8 to the high costs, and limited size. Therefore the  
9 digital images are typically transferred to a PC for  
10 storage, which is ultimately in the form of optical data  
11 storage in a typical application.

12  
13 There are two major problems for owners of digital  
14 cameras, namely the finite size and cost of proprietary  
15 flash media cards that come with the digital cameras that  
16 they buy, and the ease of sharing and displaying the  
17 final images they have captured.

18  
19 It would be advantageous to remove the need for a  
20 personal computer to control the data transfer.

21  
22 It is an object of the present invention to provide  
23 direct connection of an Optical Data Storage device and a  
24 consumer electronic device.

25  
26 According to a first aspect of the present invention,  
27 there is provided an optical storage device, adapted to  
28 act as a "host" or master on a peripheral interface.

29  
30 Preferably the optical data storage device comprises:

31  
32 a data writing means (12) to write data to an  
33 optical disc (13);

3

1 a peripheral interface (14) for data transfer to a  
2 peripheral device (16); and  
3 wherein the optical data storage device acts as the  
4 "host".  
5

6 Preferably the optical data storage device further  
7 comprises a peripheral interface host module (18) for  
8 providing host functions.

9  
10 Preferably the host module is controlled by a firmware or  
11 coding module (20).  
12

13 Preferably the format of the peripheral interface is a  
14 format for the transfer of data from peripheral device to  
15 a PC.  
16

17 Preferably the peripheral interface is the Universal  
18 Serial Bus, version 1.1.  
19

20 Alternatively the peripheral interface is a Universal  
21 Serial Bus version 2.0.  
22

23 Preferably the unit is powered from a battery supply  
24 (26).  
25

26 Alternatively the device is powered via the peripheral  
27 connector (14).  
28

29 Alternatively, the device is powered from a separate  
30 supply (28).  
31

32 Preferably the images are stored on the optical media in  
33 a format conforming to the ISO9660 standard.

4

1  
2 Preferably the images are decompressed and stored within  
3 the drive memory (22), re-compressed into a standard  
4 format (trans-coded).  
5  
6 Preferably the standard format is MPEG-1.  
7  
8 Preferably the trans-coded images are recorded onto the  
9 optical media in a format where each still image is  
10 written as a separate frame.  
11  
12 Most preferably the standard format is compatible with  
13 the Video CD (or VCD) standard.  
14  
15 Preferably the peripheral device is a device which  
16 transfers digital data to a PC.  
17  
18 Preferably the peripheral device is a Digital Still  
19 Camera (DSC).  
20  
21 Preferably the peripheral device is a digital video  
22 camera.  
23  
24 Preferably the peripheral device is a personal digital  
25 assistant (PDA)  
26  
27 Preferably the peripheral device is a mobile phone.  
28  
29 Preferably the device is further adapted to transcode  
30 data received by peer-peer transfer and produce optical  
31 discs of standard format.  
32

5

1 Preferably the device further comprises a transcoder  
2 module (30) for converting data received from a  
3 peripheral from a first format to a second format.

4

5 Preferably the device is adapted to save to a disc the  
6 data received from a peripheral transcoded or copied  
7 directly into a plurality of formats.

8

9 Preferably the discs are multi-session discs and  
10 preferably each format is saved as a separate session.

11

12 In order to provide a better understanding of the present  
13 invention, an embodiment will now be described by way of  
14 example only and with reference to the accompanying  
15 Figures, in which:

16

17 Figure 1 illustrates, in schematic form a device, in  
18 accordance with a preferred embodiment of the present  
19 invention.

20

21 The invention is an optical storage device which can act  
22 as a "Host" or master device on a user interface (e.g.  
23 Universal Serial Bus - USB). Once the device can act as  
24 host, data files can be requested from the data source  
25 (e.g. a digital camera or Personal Data Assistant - PDA),  
26 and stored on the optical medium without the need for a  
27 personal computer. This is known as peer-peer  
28 communications.

29

30 The invention also includes a method of transcoding data  
31 files received during peer-peer communications between an  
32 optical data storage device and a consumer electronic  
33 device, allowing the creation of an easily readable



6

1 standard format data disc. The data disc produced can be  
2 in a number of formats. An example of an application is  
3 the creation of a Video Disc (standard format from  
4 Philips-Sony), or an ISO9660 disc which is again a  
5 standard format. An additional example would be the  
6 creation of a "multi-session" disc which had a session in  
7 the Video Disc format, and a session in the ISO9660  
8 format. This should allow maximum compatibility with  
9 consumer electronic devices, such as DVD-Video players.

10

11 With reference to Figure 1, the optical data storage  
12 device 10 is shown. The device comprises:

13 a data writing means (12) to write data to an  
14 optical disc (13);  
15 a peripheral interface (14) for data transfer to a  
16 peripheral device (16); and  
17 wherein the optical data storage device acts as the  
18 "host".

19

20 The optical data storage device comprises a peripheral  
21 interface host module (18) for providing host functions.  
22 This is a USB Host IC. The host module is controlled by a  
23 firmware stack or coding module (20). The format of the  
24 peripheral interface is a format for the transfer of data  
25 from peripheral device to a PC. The peripheral interface  
26 is the Universal Serial Bus, version 1.1 or Universal  
27 Serial Bus version 2.0, or FireWire IEEE 1394.

28

29 The unit is powered from a battery supply (26) or via the  
30 peripheral connector (14) or from a separate supply (28).

31

32 The images are stored on the optical media in a format  
33 conforming to the ISO9660 standard.

1  
2 The images are decompressed and stored within the drive  
3 memory (22), re-compressed into a standard format, MPEG-1  
4 (trans-coded).  
5  
6 Alternatively, the images may be transferred directly to  
7 the disc via the drive memory (22).  
8  
9 The trans-coded images are recorded onto the optical  
10 media in a format where each still image is written as a  
11 separate frame. The standard format is compatible with  
12 the Video CD (or VCD) standard.  
13  
14 The peripheral device is a device which transfers digital  
15 data to a PC, e.g. a Digital Still Camera (DSC), a  
16 digital video camera, a personal digital assistant (PDA)  
17 or a mobile phone.  
18  
19 The device is further adapted to transcode data received  
20 by peer-peer transfer and produce optical discs of  
21 standard format. For this, the device further comprises a  
22 transcoder module (30) for converting data received from  
23 a peripheral from a first format to a second format.  
24  
25 The device is adapted to save to a disc with the data  
26 received from a peripheral transcoded or copied directly  
27 into a plurality of formats. The discs may be multi-  
28 session discs with each format is saved as a separate  
29 session.  
30  
31 The preferred embodiment is portable CD-RW with image  
32 download capability. The invention enables users to  
33 connect any USB digital stills camera directly to

1 portable devices enabled with image download capability,  
2 such as 12cm "Calypso" and 8cm "Samba" portable CDR and  
3 CD-RW devices from Infinite Data Storage Ltd.,  
4 Dunfermline, UK.

5

6 The present invention enables low cost CD storage and  
7 file sharing for users on the move. On a family holiday,  
8 there's no need to restrict the number of pictures you  
9 keep.

10 Instead of using expensive replacement flash cards or  
11 taking a laptop PC, you can burn as many as you like  
12 directly from your digital camera to CDs that cost as  
13 little as 50 cents each. You can use the CDs to archive  
14 your photos, and what's more they can be format  
15 compatible with your home DVD player, so you can simply  
16 view your images direct on a TV. No more PC.

17

18 The digital image download technology enables consumers  
19 with USB cameras to easily save images on very low cost  
20 media that can be accessed on a variety of PC and non-PC  
21 devices. Embedded image format conversion in the CD-RW  
22 drive allows the creation of images on VCD or ISO 9660  
23 compatible discs that can be played on any CD/DVD player.  
24 In addition the inclusion of MultiPhotoVideo  
25 compatibility further eases the accessing of pictures on  
26 home DVD video players. Applications that are normally  
27 only possible on PCs such as the mastering and burning of  
28 CDs can be completed on an embedded processor (22) such  
29 as the ARM7tdmi used in accordance with the present  
30 invention.

31

9

1 Thus the present invention allows easy storage of data on  
2 a standard optical storage medium without the need for a  
3 personal computer.

4

5 The present invention allows the creation of standard  
6 disc formats for data storage, without the need for a  
7 personal computer.

8

9 The present invention allows the creation of multi-  
10 session discs with the same data stored in different  
11 formats to maximise compatibility.

12

13 One example of application is the backup of digital  
14 images from a digital camera, whilst the user is  
15 travelling or unable to access a personal computer.

16

17 This invention removes the need for the PC, and allows  
18 creation of a copy and archival of the images produced  
19 within the camera on an optical medium. Additionally the  
20 images can be stored in different formats to allow easy  
21 use and inter-changeability of the stored images. Typical  
22 examples are storing the images in JPEG format (typical  
23 format of images from a DSC) and ISO9660 standard file  
24 structure. The ISO9660 standard allows easy interchange  
25 between types of PC (e.g. Intel based and Apple  
26 computers). Also provided according to the present  
27 invention is the ability to convert between one image  
28 encoding standard and another (trans-coding), for example  
29 JPEG into an MPEG standard format, and the subsequent  
30 creation and recording of the files in a Video CD (or  
31 VCD) format/standard. The VCD format/standard allows the  
32 still images to be viewed within for example a suitably

10

1 enabled DVD video player, thus removing the requirement  
2 for the DSC owner to also own a PC.

3

4 The example given above is that for a DSC, but this could  
5 equally apply to other CE devices, such as personal  
6 digital assistants (PDA) or digital video cameras. Other  
7 CE devices that also connect and transfer digital data,  
8 images or audio could also be connected directly to such  
9 an optical data storage device.

10

11 Further modifications and improvements may be added  
12 without departing from the scope of the invention herein  
13 described.

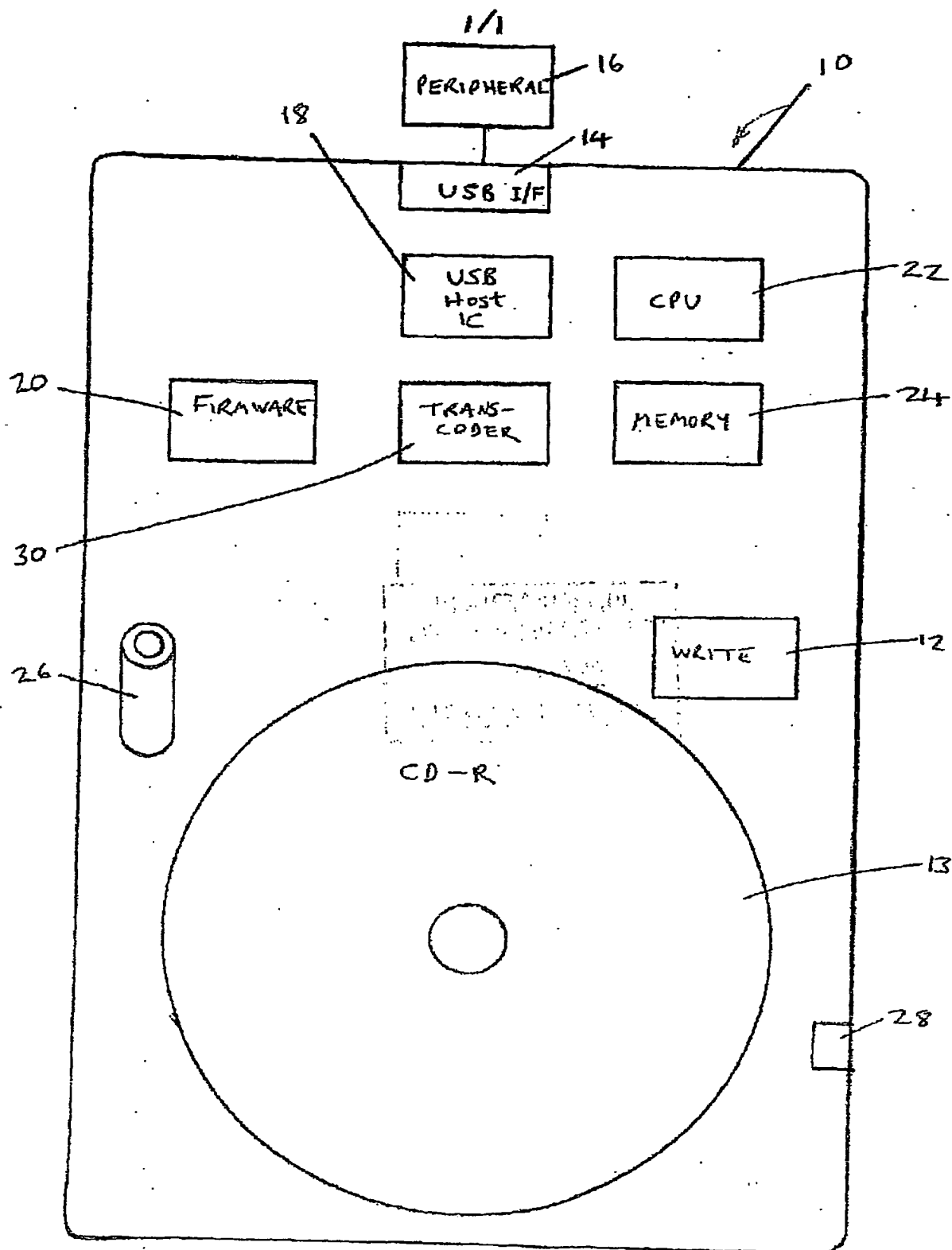


Fig. 1